7161

To: Mike Zimmerman

From: Stan Bracchi

SF FILE NUMBER

FILE PLAN
2.0

TELEFAX COVER SHEET

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION VIII
999 18th STREET - SUITE 500
DENVER, COLORADO 80202-2405

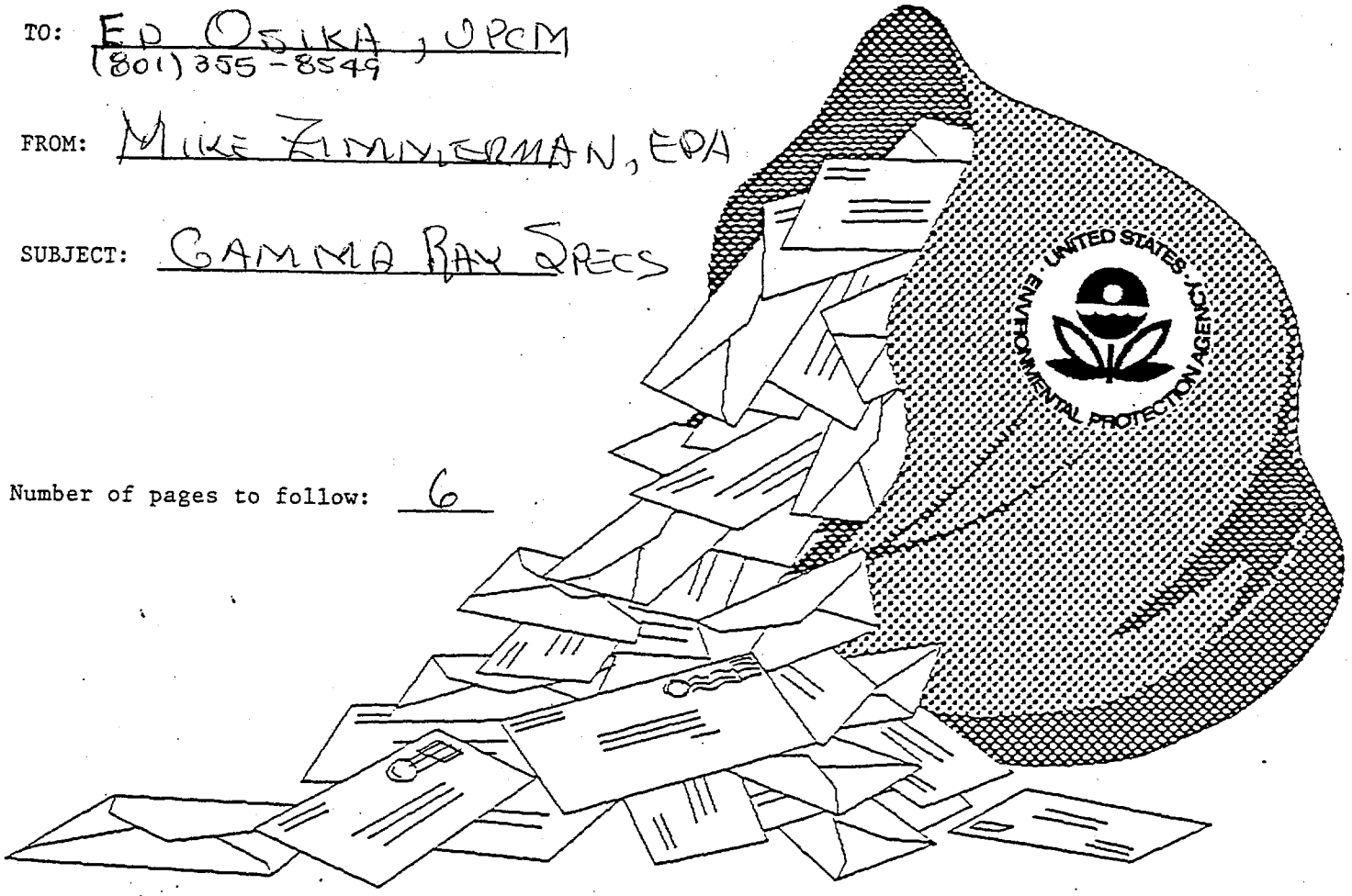
11/5/92

-- Emergency Response Branch --

TO: ED OSIKA, UPCM
(801) 355-8549

FROM: MIKE ZIMMERMAN, EPA

SUBJECT: GAMMA RAY SPECS



Number of pages to follow: 6

COMMENTS:

Please call (303) 294-7134 if you have any problems.

Our return fax number is (303) 294-7168. Thank you.

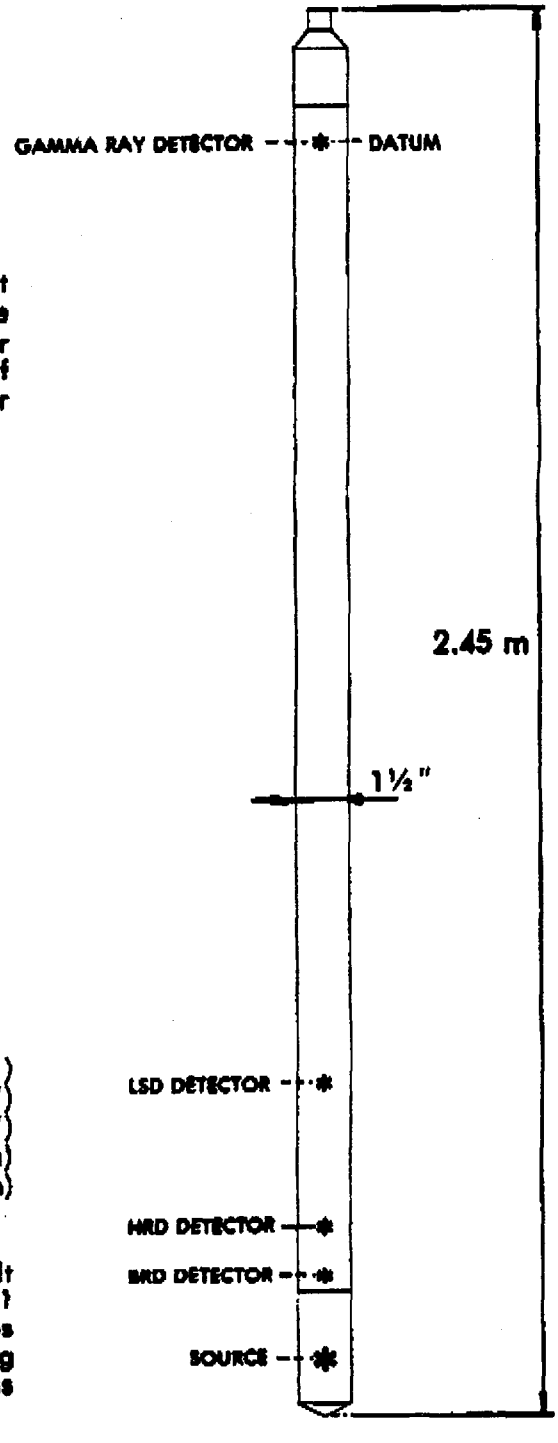
DD2 DUAL DENSITY, GAMMA RAY, SONDE.

(OR COAL TRI-SONDE)

MEASUREMENTS:

LONG SPACING DENSITY (LSD)
BED RESOLUTION DENSITY (BRD)
or HIGH RESOLUTION DENSITY (HRD)
GAMMA RAY

The DD2 Sonde has been designed as a specialist alternative to the more universal DD1, for use in more restricted diameters and/or for logging through casing or drill rods. It is a 3 channel device offering the option of either a 'BRD' or an 'HRD' measurement as the higher resolution density log.



DD2 SCHEMATIC

GENERAL SPECIFICATIONS:

Length	— 2.45 m (8')
Weight	— 14 kg (30 lbs)
Diameter	— 3.8 cm (1½")
Temperature	— up to 70°C (158°F)
Pressure	— up to 210 kg/cm² (3000 p.s.i.)

OPERATING CONDITIONS:

Hole Depth	— to a max of approx.	2000 m (6500')
Hole Diameter	— open hole:	6 to 20 cm (2½" to 8")
	— casing or rods:	5 to 20 cm (2" to 8")
Logging Speed	— standard logging:	9 m/min (30'/m)
	— detail logging:	2.25 m/min (7.5'/m)
Logging Mode	— *free running*	

The DD2 Sonde can provide good basic logging in difficult borehole conditions which may preclude the use of the DD1 sonde. Environments may include dry or fluid filled holes and logging may proceed in open hole, through casing (conventional or plastic) or through the drill rods, as formation stability problems dictate.

TECHNICAL INFORMATION:

GAMMA RAY — Measurement of naturally occurring radioactivity utilizes an identical system to that incorporated in the DD1 Sonde.

DENSITY — The principle of operation remains as described in the DD1 leaflet, although the overall systems do differ in some significant ways, specifically:

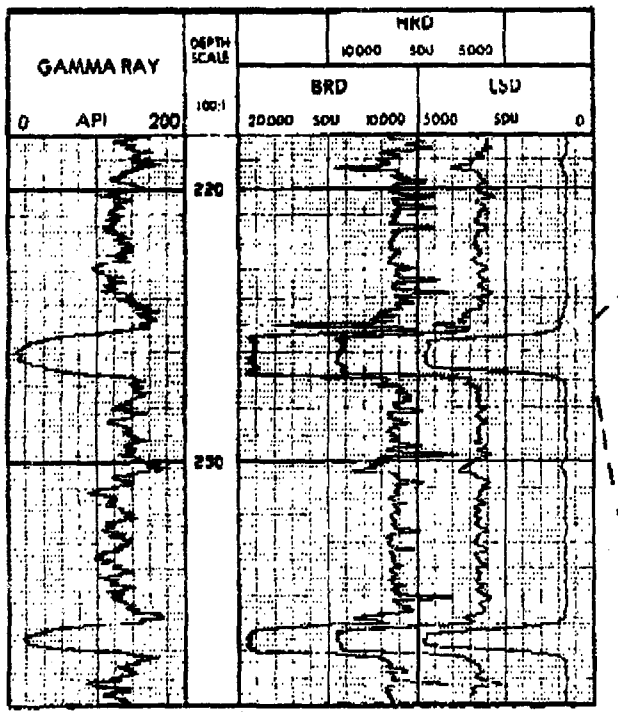
- — both density channels operate without collimation of either the source or detectors, i.e. measurements utilize a full 360° window around the borehole wall,
- — the sonde operates in a 'free running' mode, as opposed to the caliper controlled 'sidewall' configuration of the DD1.

LSD — A source to detector spacing of 48 cm (19") is maintained.

BRD (or HRD) — The standard mode of operation offers a 15 cm (6") spacing BRD log as the higher resolution density channel, although the option exists for this to be modified to a 24 cm (9.5") HRD measurement as required.

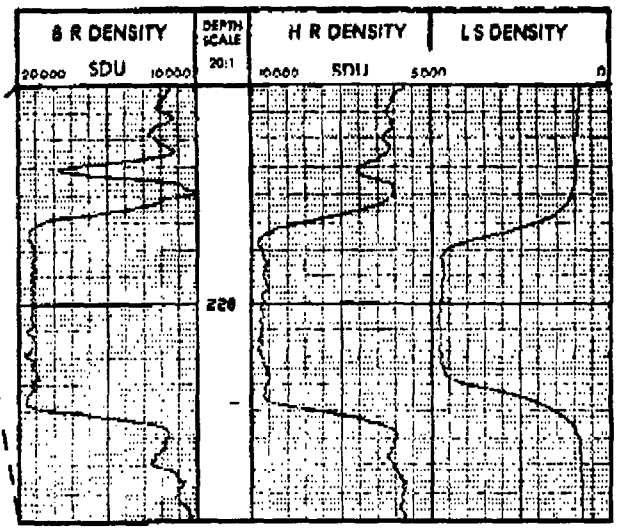
SOURCE — A doubly encapsulated sealed source of Caesium 137 at an activity of 50 mCi, is mounted within a holder securely locked to the sonde during logging operations. This source holder is transported in a purpose designed shield with a surface radiation level less than 7 mrem/hr.

PRESENTATION:



General Scale Lithology Logging

Metric or Imperial scale logs may be presented on any API based format. 'General' scales range from 100:1 upward whilst 'Detail' scales, reserved for closer investigation of zones of interest, are available down to 10:1.



Detail Scale Seam Evaluation

APPLICATION SUMMARY:

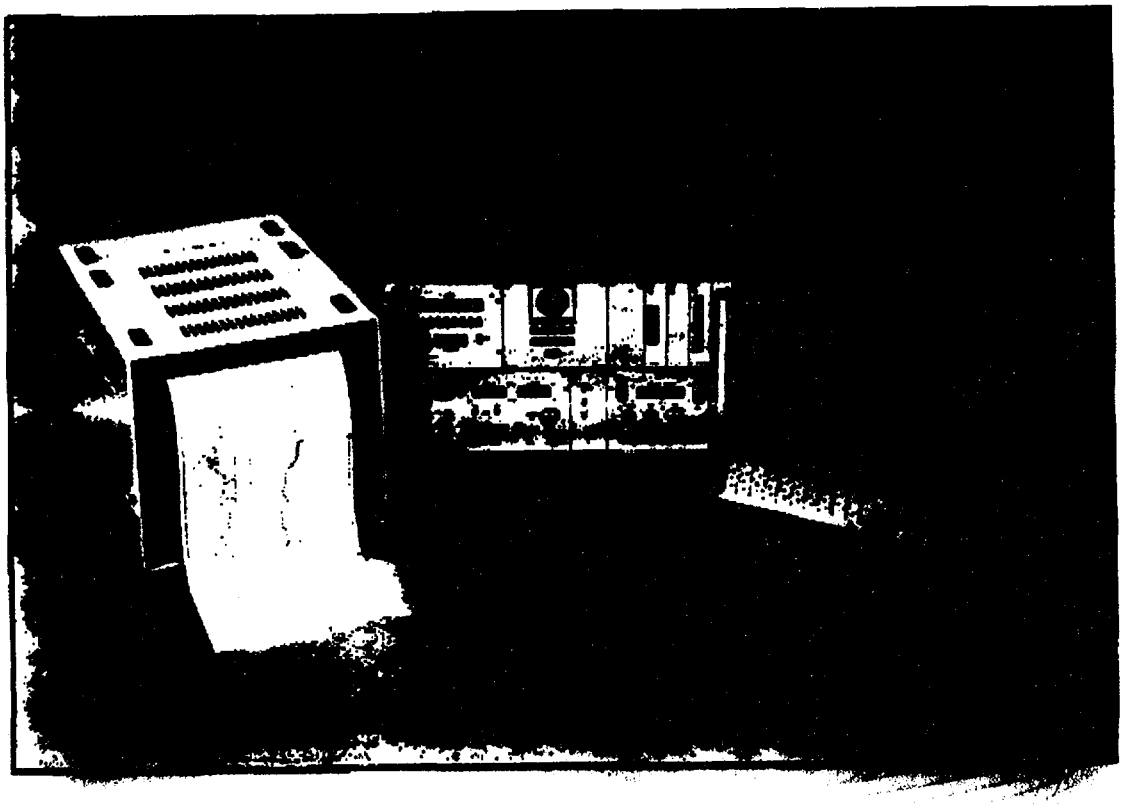
The DD2 provides a basic single run Gamma/Density evaluation package, primarily for application where borehole conditions preclude use of the DD1.

GAMMA RAY	— Shale content, Lithology identification and Correlation
DENSITY : LSD	— Lithology identification and Correlation, Porosity indicator
: BRD (or HRD)	— More precise boundary definition and seam thickness evaluation

REFERENCES:

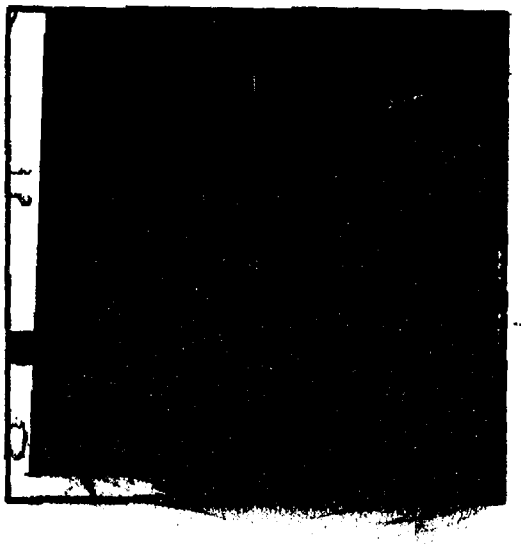
Further information may be found in: The DD1 Sonde — Subsurface leaflet No. 1

SLIMLINE GRAPHICS UNIT



SLIMLINE SERVICES

SGU Deep Logging Unit



Slimline High Angle Dipmeter

FEATURES

REAL TIME DIPMETER INTERPRETATION

REAL TIME CALIBRATED, FINAL HEADED LOGS FROM THE HIGH RESOLUTION THERMAL PLOTTER ON FANFOLD OR PLAIN, TRANSLUCENT AND CLEAR FILM ROLLS.

INDUSTRY STANDARD LIS 9 TRACK TAPES ON SITE

INDUSTRY STANDARD LAS FLOPPY DISCS ONSITE

UNRIVALED FLEXIBILITY IN OUTPUT PRESENTATION : MERGED LOGS; TVD CORRECTIONS; SONIC INTEGRATION; SONIC VELOCITY LOGS; HOLE VOLUME; ANNULAR VOLUME; CROSS PLOTS; VERTICALITY CROSS SECTIONS.

REPROCESSING OF DETAIL ZONES.

SS1 SONIC WAVEFORM RECORDING AND PRESENTATION

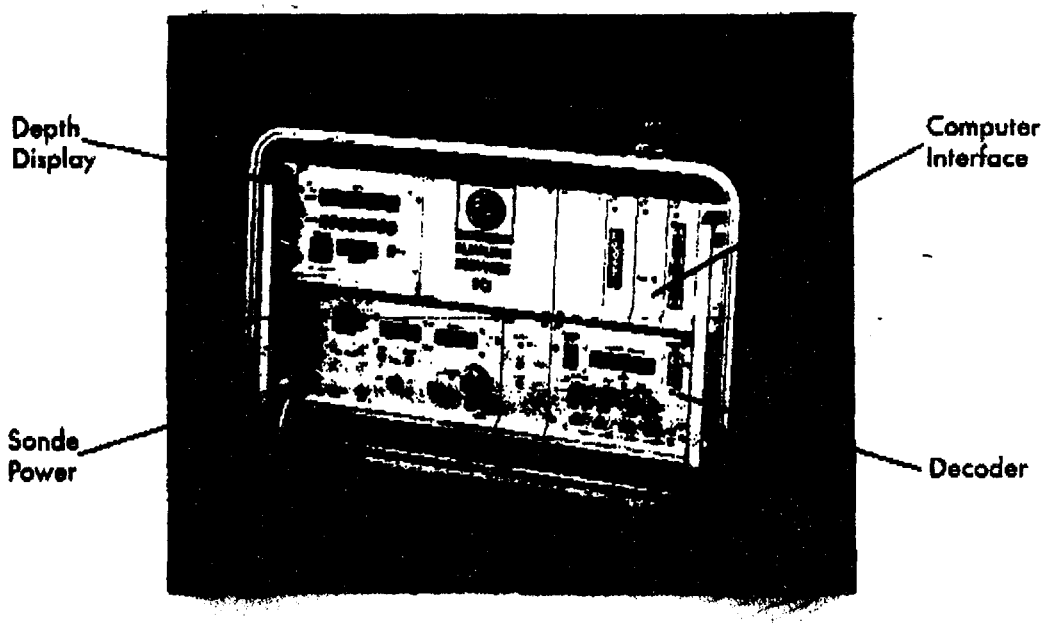
API OILFIELD REPLAY SYSTEM WITH PRESENTATION GRAPHICS FEATURING CURVE IDENTIFICATION AND SHADING OPTIONS.

ON SITE INTERPRETATION, LISTING AND DISPLAY PACKAGES FOR LITHOLOGY ANALYSES, ASH ANALYSES, VERTICALITY, SPECTRAL GAMMA, SEISMIC REFERENCE REPORTS, DRIFT CORRECTED SONIC, BREAKOUT ANALYSES, STRENGTH INDICES.
A FULL TLS COMPUTER CENTRE IN THE FIELD

FULL SUPPORT FOR REPROCESSING AND REFORMATTING PREVIOUSLY RECORDED BPB DATA CASSETTES

DATA TRANSMISION BY PHONE OR RADIO LINK

HIGH RESOLUTION COLOUR PLOTTING



SGU in Flight case

DESCRIPTION

The Slimline Graphics Unit SGU is a portable computer and presentation graphics display system linked by the Slimline Computer Interface SCI to the full range of BPB Slimline Downhole Sondes.

Raw data is recorded in 100 mm, 10 mm, or 2 mm depth sample increments and the surface computer simultaneously calculates and records raw data together with fully calibrated, filtered, corrected or compensated data to either floppy or hard disc using verification to ensure data integrity.

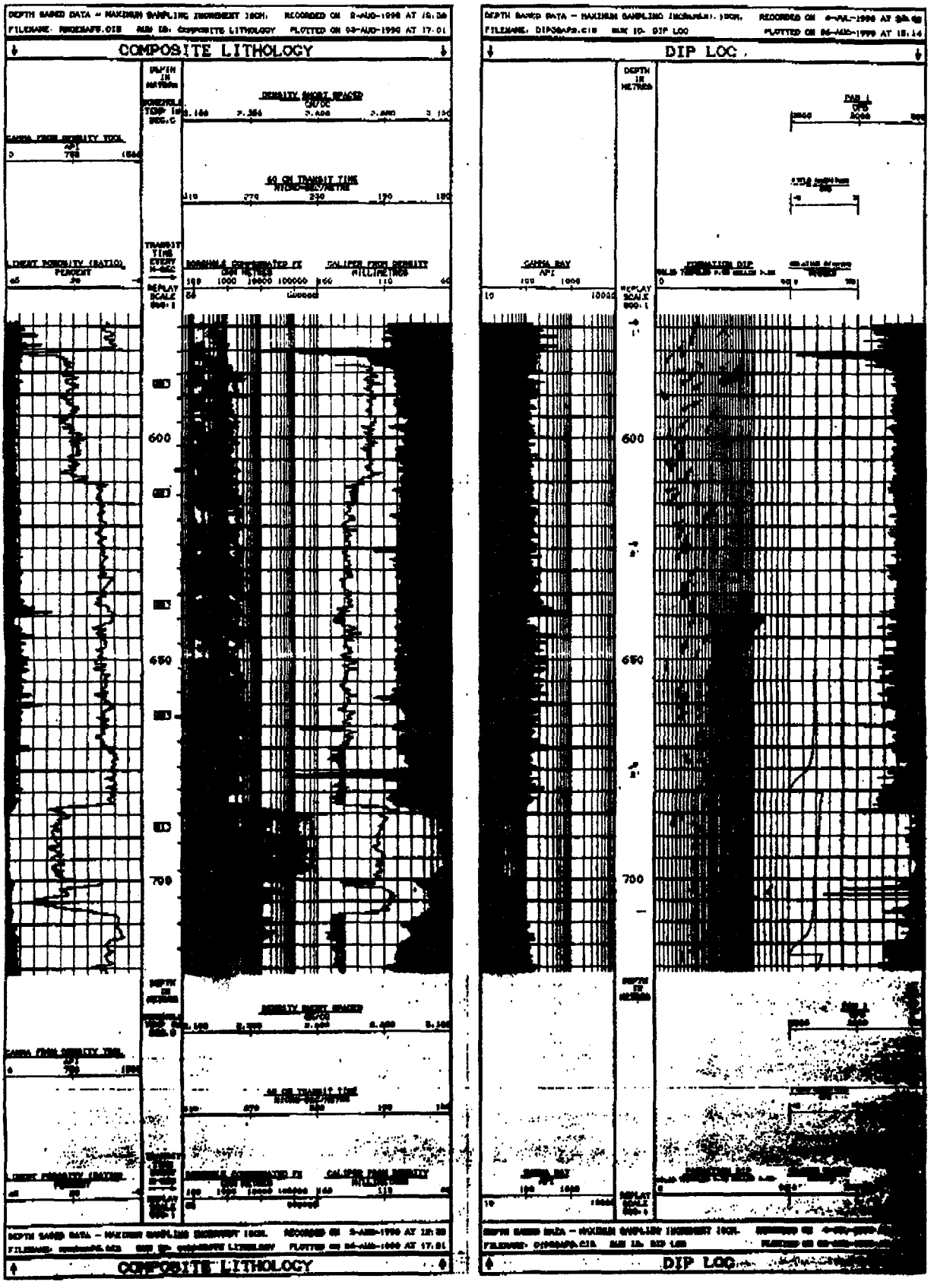
Logging can be undertaken going downhole, coming up hole or in time mode. A full range of depth scales are available for real time plotting in either metres or feet.

The equipment is small lightweight and extremely portable. Whilst the SCI is permanently fixed in the logging truck, the portable computer, plotter and optional tape drive may be set up anywhere for reprocessing, analyses or replay presentation. On intensive programmes a second portable computer and plotter could be deployed.

OPERATION

On arrival at location the engineer inputs borehole data, calibrations and the required output presentation; calls up the desired tool software and runs into the hole. Upon reaching the required logging depth a single key input starts recording the logging data.

On completion of logging a comprehensive range of processing, analysis, interpretation, replay and data handling packages are available for use on site, back at field camp, at base or in the client's office.



ON SITE DIPMETER INTERPRETATION Example